

1 LOW PROFILE PLASTIC PANEL ENCLOSURE

2

3 Field of the Invention

4 This invention relates generally to a low profile
5 enclosure constructed of plastic structural panels. More
6 specifically, the present invention relates to a low profile
7 enclosure which includes telescoping roof panels.

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9 Background Information

10 Storage sheds are a necessity for lawn and garden care,
11 as well as general all-around home storage space. Typically,
12 garden tools and equipment are found either stacked into a
13 corner of the garage, or bundled together and covered with a
14 tarpaulin to protect them from the elements. During the
15 off-seasons, lawn mowers, tillers and snow equipment often
16 consume the available floor space of a garage, forcing the
17 homeowner to park his/her automobile outside.

18 The prior art has proposed a number of different panel
19 systems, or kits comprising blow molded or extruded panels
20 and connector members for forming a wide variety of
21 structures. Typically such systems are assembled into
22 structures having a height sufficient to allow the owner to
23 walk into the structure. Generally, such systems require
24 extruded metal or plastic connector members having a specific

1 cross-sectional geometry that facilitate an engagement
2 between such members and one or more blow molded plastic
3 panels having a complimentary edge configuration. Due to the
4 nature of the manufacturing process, blow molded plastic
5 components cannot be formed with the intricate shapes and/or
6 sharp corners required for integrated connectors. In
7 addition, blow molded plastic components are hollow and
8 cannot be formed with the integral strengthening ribs and
9 gussets possible with injection molding.

10 A particularly common structure for the connector
11 members is the I-beam cross section. The I-beam defines free
12 edge portions of the connector member which fit within
13 appropriately dimensioned and located slots in the panel
14 members. U.S. Patent No. D-371,208 teaches a corner
15 extrusion for a building sidewall that is representative of
16 the state of the art I-beam connector members. The I-beam
17 sides of the connector engage with the peripheral edge
18 channels of a respective wall panel and thereby serve to join
19 such panels together at right angles. Straight or in-line
20 versions of the connector members are also included in the
21 kits to join panels in a coplanar relationship to create
22 walls of varying length.

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1 The aforementioned systems can also incorporate roof and
2 floor panels to form a freestanding enclosed structure such
3 as a utility shed. U.S. Patent Nos. 3,866,381; 5,036,634;
4 and 4,557,091 disclose various systems having interfitting
5 panel and connector components.

6 Such prior art enclosure systems, while functional,
7 nevertheless fail to meet longfelt needs of consumers to
8 provide structural integrity combined with modularity and
9 aesthetic appearance. The walk-in structures may be
10 undesirable or unsightly where the roofs are visible over
11 neighborhood fences or hedges. In some areas homeowner
12 associations may not permit structures having an adequate
13 height to allow the owner to walk into the enclosure due to
14 the unsightly nature of the visible roof tops.

15 Paramount among such needs is a telescoping roof and
16 pivoting door combination which allows items such as lawn
17 tractors to be driven into the enclosure. Telescoping roof
18 panels allow a low profile enclosure while still allowing an
19 owner to walk into the enclosure for easy access to the
20 contents. From a structural standpoint, the telescoping roof
21 should be capable of easy installation after assembly of the
22 wall and floor components, and be compatible with the walls.
23 The wall and floor components should utilize a panel system
24 which eliminates the need for panel connectors creating

1 enclosure walls which resist panel separation, buckling,
2 racking and weather infiltration.

3 There are also commercial considerations that must be
4 satisfied by any viable low profile enclosure system or kit;
5 considerations which are not entirely satisfied by state of
6 the art products. The enclosure must be formed of relatively
7 few component parts that are inexpensive to manufacture by
8 conventional techniques. The enclosure must also be capable
9 of being packaged and shipped in a knocked-down state. In
10 addition, the system must be modular and facilitate the
11 creation of a family of enclosures that vary in size but
12 which share common, interchangeable components.

13 Finally, there are ergonomic needs that an enclosure
14 system must satisfy in order to achieve acceptance by the end
15 user. The system must be easily and quickly assembled using
16 minimal hardware and requiring a minimal number of tools.
17 Further, the system must not require excessive strength to
18 assemble or operate. Moreover, the system must assemble
19 together in such a way so as not to detract from the internal
20 storage volume of the resulting enclosure, or otherwise
21 negatively affect the utility of the structure.

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1 **Brief Description of the Invention**

2 The present invention provides a system, or kit, of
3 injection molded panels having integrated connectors which
4 combine to form an enclosure, commonly in the form of a low
5 profile utility enclosure. The enclosure is provided with a
6 telescoping roof panel and pivoting doors which allow easy
7 and dependable access to the interior of the enclosure. The
8 system incorporates a minimum number of components to
9 construct a low profile enclosure by integrally forming
10 connectors into injection molded panels. The panels utilized
11 to construct the low profile enclosure are formed of
12 injection molded plastic and include sockets which accept
13 both roof and floor locking posts for interlocking
14 cooperative engagement which serves to rigidly connect the
15 components together.

16 This minimizes the need for separate extruded or molded
17 connectors to assemble the low profile enclosure. The
18 symmetry of the wall, roof, floor and door components also
19 minimizes component shapes and simplifies enclosure
20 construction. Injection molding the wall panels allows them
21 to be formed with adequate height to eliminate the need for
22 stacking panels to achieve the desired height. Injection
23 molding also allows the panels to be formed with integral

1 cross-bracing, ribs and gussets for increased rigidity when
2 compared to blow molded or extruded panels.

3 In one embodiment the enclosure system utilizes three
4 types of wall panel construction for the side walls,
5 expansion of the side walls, and the rear wall assembly. The
6 embodiment also utilizes one construction of fixed roof
7 panel, one construction of sliding roof panel, and one
8 construction of floor panel. The system further includes a
9 door assembly which utilizes two types of panels and slides
10 into place after the walls and roof have been fully
11 assembled. The floor of the system is constructed to allow
12 optional wooden or plastic floor joists to be added to the
13 plastic floor panels further increasing the structural
14 integrity of the enclosure. The same components are used to
15 create sheds of varying size and the assembly of the system
16 requires minimal hardware and a minimum number of hand tools.

17 Accordingly, it is an objective of the present invention
18 to provide a modular panel system having integrated
19 connectors for creating low profile enclosures of varying
20 dimension using common components.

21 A further objective is to provide a modular panel system
22 for creating low profile enclosures wherein the panels
23 include integrated connectors which accommodate injection

1 molding plastic formation of the panel components for
2 increased structural integrity.

3 Yet a further objective is to provide a low profile
4 enclosure constructed from modular panels in which the side
5 walls, roof, and floor are integrally interlocked without I-
6 beam connectors.

7 Another objective is to provide a low profile enclosure
8 constructed of modular panels having a roof assembly which
9 allows a portion of the roof to be telescopically retracted
10 and extended.

11 Other objectives and advantages of this invention will
12 become apparent from the following description taken in
13 conjunction with the accompanying drawings wherein are set
14 forth, by way of illustration and example, certain
15 embodiments of this invention. The drawings constitute a
16 part of this specification and include exemplary embodiments
17 of the present invention and illustrate various objects and
18 features thereof.

1 BRIEF DESCRIPTION OF THE FIGURES

2 FIGURE 1 is a perspective view of a low profile
3 enclosure constructed using the instant enclosure system;

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5 FIGURE 2 is an exploded view of the enclosure shown in
6 FIGURE 1;

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8 FIGURE 3 is a perspective view of one embodiment of the
9 floor assembly utilized in the instant invention;

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11 FIGURE 4A is a perspective view of the floor assembly
12 illustrating the optional wooden floor joists;

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14 FIGURE 4B is a perspective view of the floor assembly
15 illustrating the sliding engagement of the floor panels;

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17 FIGURE 5 is a bottom view of the floor assembly
18 illustrating the cross-bracing;

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20 FIGURE 6 is a partial perspective view illustrating
21 assembly of the first left side wall panel to the floor
22 assembly;

23

1 FIGURE 7 is a partial perspective view further
2 illustrating assembly of the left side wall panels;

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4 FIGURE 8 is a partial cross sectional view illustrating
5 the locking engagement between the dowel and adjacent wall
6 panels;

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8 FIGURE 9 is a partial perspective view illustrating
9 assembly of the rear wall panels;

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11 FIGURE 10 is a partial perspective view further
12 illustrating assembly of the rear wall panels;

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14 FIGURE 11 is a partial perspective view illustrating
15 assembly of the right side wall panels;

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17 FIGURE 12 is a partial perspective view further
18 illustrating assembly of the right side wall panels;

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20 FIGURE 13 is a perspective partially exploded view of
21 the roof panels utilized in the instant invention;

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23 FIGURE 14 is a perspective view of the bottom surface of
24 the telescoping roof panel utilized in the instant invention;

1 FIGURE 15 is a perspective view of the bottom surface of
2 the fixed roof panel utilized in the instant invention;

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4 FIGURE 16 is a front view illustrating the door assembly
5 utilized in the instant invention;

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7 FIGURE 17 is a perspective view illustrating the
8 installation of one of the doors;

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10 FIGURE 18 is a partial perspective view of the enclosure
11 with enlarged partial views illustrating assembly of the door
12 hinges utilized in the instant invention;

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14 FIGURE 19 is a partial perspective view of the enclosure
15 with enlarged partial views illustrating assembly of the door
16 hinges utilized in the instant invention;

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18 FIGURE 20 is a partial view illustrating assembly of one
19 of the door latch housings utilized in the instant invention;

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21 FIGURE 21 is a partial view illustrating assembly of one
22 of the door latch pins utilized in the instant invention;

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1 Detailed Description of the Preferred Embodiments

2 While the present invention is susceptible of embodiment
3 in various forms, there is shown in the drawings and will
4 hereinafter be described a presently preferred embodiment
5 with the understanding that the present disclosure is to be
6 considered an exemplification of the invention and is not
7 intended to limit the invention to the specific embodiments
8 illustrated.

9 FIGS. 1 and 2 which are now referenced show an isometric
10 and exploded view of the low profile enclosure, generally
11 referenced as 10, according to a preferred embodiment of the
12 present invention. The enclosure is made up of a floor
13 assembly 100, left and right side wall assemblies 200, rear
14 wall assembly 300 (FIG. 2), roof assembly 400 and door
15 assembly 500. In the preferred embodiment, the panels
16 comprising the assemblies are formed of, but not limited to,
17 a suitable polymeric material through the process of
18 injection molding. The result is that the panels comprising
19 the floor 100, walls 200-300, roof 400, and doors 500 of the
20 enclosure 10 are formed as unitary panels with integral
21 connectors and cross bracing. Strengthening ribs 204 and
22 gussets 206 (FIG.2) are formed within the inner surfaces of
23 the wall panels 202, 203, 302 and 502 in order to enhance
24 rigidity of the panels while leaving the external surface in

1 a generally smooth condition for aesthetic purposes, as shown
2 in FIG. 1. The panels are utilized to construct the floor
3 assembly 100, left and right wall assemblies 200, rear wall
4 assembly 300, door assembly 500, and roof assembly 400 using
5 a minimal number of components.

6 Referring to FIGS. 3-5, the enclosure includes a pair of
7 like-constructed floor panels 102. Each panel has a top
8 surface 104, bottom surface 106, locking edge 108, ramp edge
9 110, and two closed edges 112 and 114. Adjacent to each of
10 the closed edges is a means of attaching the floor assembly
11 to the wall assemblies illustrated as a plurality of locking
12 posts 116 extending upwardly from the top surface 104. The
13 locking posts 116 are constructed and arranged to cooperate
14 with sockets 210 (FIG. 7) located at each longitudinal end of
15 the first, second, and third structural wall panels 202, 302
16 and 203 respectively. Adjacent to each of the ramp edges 110
17 is a pair of generally cylindrical hinge pins 128 extending
18 upwardly. The hinge pins 128 cooperate with the door panels
19 502 to allow pivotal movement. A series of spaced apart
20 tubes 118 extend through each floor panel 102 under the top
21 surface 104 and between the locking edge 108 and the ramp
22 edge 110. The tubes 118 are sized to accept optional wooden
23 floor joists 120 (FIGS. 4A,4B) adding increased weight
24 capacity and stability to the enclosure 10. Along the

1 locking edge 108 of each bottom panel 102 is a series of
2 spaced apart fingers 122 and recesses 124 for attaching the
3 panels together into a floor assembly 100; each of the
4 fingers being provided with at least one countersank aperture
5 for receiving a fastener (not shown). The fingers 122 and
6 recesses 124 are constructed and arranged so that the fingers
7 122 overlap and mateably engage the recesses 124 and the
8 fasteners secure the panels together in an inter-fitting
9 engagement with their respective top surfaces 104 in a co-
10 planar arrangement. The bottom surface 106 (FIG. 5)
11 illustrates the cross-bracing 128 facilitated by injection
12 molding of panels. Injection molding offers significant
13 strength and stability advantages over blow-molding as
14 utilized in the prior art. In this manner the enclosure of
15 the instant invention is capable of handling a significant
16 amount of weight as compared to blow molded enclosures.

17 Referring to FIGS. 6-7 a first structural side wall
18 panel is shown. The first structural wall panel 202
19 constitutes one of a plurality of like-configured panels in
20 the system used to construct the left and right side wall
21 assemblies 200. The first structural wall panels 202 are
22 each configured having a first longitudinal end 208 including
23 an integrally formed attachment means illustrated as a
24 plurality of sockets 210. A second longitudinal end 212 also

1 including an integrally formed attachment means also
2 illustrated as a plurality of sockets 210. The sockets 210
3 are generally constructed and arranged to cooperate with
4 either a floor assembly 100 or a roof assembly 400. The
5 first horizontal edge 222 is constructed generally flat
6 extending inwardly to a depending semi-circular conduit 224,
7 the semi-circular conduit 224 extending from the second
8 horizontal end 212 toward the mid-portion of the edge 222.
9 The conduit 224 is arranged to cooperate with a structural
10 wall panel member 302 having a complimentary semi-circular
11 conduit in a perpendicular relationship. To facilitate
12 mechanical connection with structural second wall panel
13 members 302 in a co-planar relationship the panels are
14 provided a second horizontal edge 214 constructed with an
15 attachment means illustrated as a semi-circular conduit 216
16 extending from about the first longitudinal end 208 past the
17 middle portion of the edge 214. Centrally located within the
18 semi-circular conduit 216 is a generally circular aperture
19 218 for accepting a dowel 220.

20 Continuing with regard to FIGS. 6-8, a third structural
21 side wall panel is shown. The third structural wall panel
22 203 constitutes one of a plurality of like-configured panels
23 in the system used to construct the left and right side wall
24 assemblies 200. The third structural wall panels 203 are

1 each configured having a first longitudinal end 209 including
2 an integrally formed attachment means illustrated as a
3 plurality of sockets 210. A second longitudinal end 213 also
4 including an integrally formed attachment means also
5 illustrated as a plurality of sockets 210. The sockets 210
6 are generally constructed and arranged to cooperate with
7 either a floor assembly 100 or a roof assembly 400. To
8 facilitate mechanical connection with structural second wall
9 panel members 302 in a co-planar relationship the panels are
10 provided a first horizontal edge 215 constructed with an
11 attachment means illustrated as a semi-circular conduit 217
12 extending from about the second longitudinal end 213 toward
13 the middle portion of the edge 215. Centrally located within
14 the semi-circular conduit 217 is a generally circular
15 aperture 218 for accepting a dowel 220. The second
16 horizontal edge 223 is constructed generally flat extending
17 inwardly to a depending semi-circular conduit 224, the semi-
18 circular conduit 224 extending from the first horizontal end
19 209 toward the mid-portion of the edge 223. The conduit 224
20 is arranged to cooperate with a structural wall panel member
21 302 having a complimentary semi-circular conduit in a
22 perpendicular relationship.

23 Continuing with regard to FIGS. 6-8, the outer surface
24 228 (FIG. 2) of the panels 202 and 203 are constructed

1 generally smooth having a plurality of inwardly bowed
2 surfaces 230 for added strength and aesthetic appearance.
3 The inside of the panels 232 are constructed with a plurality
4 of ribs 204 extending from the first edge 222, 223 across the
5 panel 202, 203 to the second edge 214, 215 respectively.
6 Each of the ribs 204 being provided with a plurality of
7 gussets 206 to further strengthen the panels. The ribs 204
8 and gussets 206 increase the structural integrity of the
9 enclosure 10 by preventing the panels 202, 203 from bowing or
10 bending inwardly or outwardly, and thus, adversely affecting
11 the appearance or operation of the enclosure 10. The
12 reinforced ribs also provide support for optional shelves
13 (not shown). The construction of the ribs 204 allow shelving
14 to extend across the span of the shed thereby dividing the
15 load between two walls and eliminating the cantilever effect
16 of attaching a shelf to a single wall surface.

17 Assembly of the left side wall 200 of the shed is
18 completed by attaching the first wall panel 202, second wall
19 panel 302, and third wall panel 203 to the interconnected
20 floor-panels 102 by sliding the first longitudinal ends 208,
21 308, 209 respectively over a plurality of the locking posts
22 116. Thereafter, each corresponding panel being slid into
23 place in an adjacent relationship to the prior panel. The
24 sockets 210 in each end of the panels 202, 302, 203

1 correspond in shape and size to that of the posts 116.
2 Spring tabs 126 (FIG. 3) integrally formed into the posts 116
3 align with apertures 234 in the sockets 210 to engage the
4 side wall panels 202, 302 and 203. The result is a positive
5 mechanical connection between the wall-panels 200 and the
6 floor assembly 100. The first wall panel 202 being assembled
7 to the floor assembly 100 with the first longitudinal end 208
8 downward. The second panel 302 is thereafter assembled
9 adjacent to the first with its first longitudinal end 308
10 downward (FIG. 7). The third wall panel 203 is assembled
11 adjacent to the second panel with its first longitudinal end
12 209 downward. Secured to the first longitudinal end 209 of
13 the conduit 224 of the third assembled wall panel 203 is a
14 hinge pin connector 238 constructed and arranged to cooperate
15 with a floor assembly hinge pin 128 (FIG. 3) and the rear
16 wall assembly 300.

17 It will be appreciated that the purpose of the semi-
18 circular conduits 216, 224 are to align two panels in a co-
19 planar or perpendicular relationship and to facilitate their
20 mechanical connection via the dowel 220. The semi-circular
21 conduits 216, 224 are brought into an overlapping
22 relationship wherein a dowel pin 220 enters the corresponding
23 aperture 218 in each conduit (FIG. 6). The result is a
24 mechanically secure connection between the two panels (FIG.

1 8). The overlapping edges between the panels as described
2 above provides a secure connection and offers several
3 advantages. First, the design allows the panels to be
4 connected without the need for I-beam connectors. Second,
5 the design creates a positive lock that prevents separation
6 of the panels. Third, the design maintains alignment of the
7 panels in the same plane and prevents bowing or bending of
8 either panel relative to one another. The resultant wall
9 created by the combination of the interlocking wall-panels
10 benefits from high structural integrity and reliable
11 operation.

12 Referring to FIGS. 9-10, assembly of the structural rear
13 wall is shown. The second wall panel 302 constitutes one of
14 a plurality of like-configured panels in the system used to
15 construct the rear wall assembly 300. The second wall panels
16 302 are each configured having a first longitudinal end 308
17 including an integrally formed attachment means illustrated
18 as a plurality of sockets 210. A second longitudinal end 312
19 includes an integrally formed attachment means also
20 illustrated as a plurality of sockets 210. The sockets are
21 generally constructed and arranged to cooperate with either a
22 floor assembly 100 or a roof assembly 400. To facilitate
23 mechanical connection with first, second, or third wall panel
24 members 202, 302, 203 respectively in a co-planar or

1 perpendicular relationship, the panels are provided a first
2 horizontal edge 314 constructed with a semi-circular conduit
3 316 extending from about the second longitudinal end 312
4 toward the middle portion of the edge. Centrally located
5 within the semi-circular conduit 316 is a generally circular
6 aperture 318 for accepting a dowel 220. The second
7 horizontal edge 322 is constructed generally the same as the
8 first horizontal edge 314 with the exception that the semi-
9 circular conduit 324 extends from the first horizontal end
10 308 past the mid-portion of the panel. The conduits 316, 324
11 are arranged to cooperate with a other panel members having a
12 complimentary semi-circular conduit in a co-planar or a
13 perpendicular relationship. Hinge cap 336 is constructed and
14 arranged to cooperate with the first longitudinal end of the
15 semi-circular conduit and a floor assembly hinge pin 128.

16 Continuing with regard to FIGS. 9-10, the outer surface
17 328 (FIG. 2) of the panels 302 are constructed generally
18 smooth having a plurality of inwardly bowed surfaces 330
19 (FIG. 2) for added strength and aesthetic appearance. The
20 inside of the panel 332 is constructed with a plurality of
21 ribs 304 extending from the first edge 314 across the panel
22 to the second edge 322. Each of the ribs 304 being provided
23 with a plurality of gussets 306 to further strengthen the
24 panel 302. The ribs 304 and gussets 306 increase the

1 structural integrity of the enclosure 10 by preventing the
2 panels 302 from bowing or bending, inwardly or outwardly and
3 thus, adversely affecting the appearance or operation of the
4 enclosure 10.

5 The panels 302 are attached to the interconnected floor
6 panels 102 and the installed left side panels 202, 203 by
7 sliding the first longitudinal end 308 of a second wall panel
8 downward over a dowel 220 aligning the semi-circular
9 conduits. The second assembled rear panel 302 being adjacent
10 in relation to the first and slid downward engaging the
11 inserted post 338 and the hinge pin in the floor assembly via
12 a hinge cap 336 inserted into the semi-circular conduit and
13 engaging the first assembled rear panel via the dowel 220.
14 Spring tabs 126 integrally formed into the inserted post 338
15 and hinge caps 336 align with apertures 234 in the second
16 wall panels 302 for engagement. The result is a positive
17 mechanical connection between the left wall assembly 200,
18 rear wall assembly 300 and the floor assembly 100.

19 Referring to FIGS. 11-12 the right side wall panels are
20 attached to the interconnected floor-panels 102 and the
21 assembled rear wall assembly 300 by sliding the first
22 longitudinal end 208 of a first wall panel 202 over a
23 plurality of the locking posts 116. The second wall panel
24 302 is thereafter assembled adjacent to the first with its

1 first longitudinal end 308 downward (FIG. 7). The third wall
2 panel 203 is assembled adjacent to the second panel with its
3 first longitudinal end 209 downward. Secured to the first
4 longitudinal end 209 of the conduit 224 of the third
5 assembled wall panel 203 is a hinge pin connector 238
6 constructed and arranged to cooperate with a floor assembly
7 hinge pin 128 (FIG. 12) to allow rotational movement of the
8 door assembly 500. The sockets 210 in the ends of the panels
9 202, 203 and 302 correspond in shape and size to that of the
10 posts 116, and spring tabs 126 (FIG. 3) integrally formed
11 into the posts 116 align with apertures 234 in the sockets
12 210 to engage the side wall panel 202, 203 or 302. The
13 result is a positive mechanical connection between the wall
14 panels 200 and the floor assembly 100.

15 Referring to FIGS. 13-15 the enclosure 10 includes a
16 fixed roof panel 402 and a sliding roof panel 403. The fixed
17 roof panel includes a top surface 404, bottom surface 406,
18 and four closed edges 408, 410, 412 and 414. The bottom
19 surface of the fixed roof panel is constructed generally
20 smooth and may include a securely attached steel
21 reinforcement tube 480 to add additional structural integrity
22 to the roof assembly. (FIG. 15) Adjacent to the two side
23 closed edges 410, 414 and the rear closed edge 412 are a
24 plurality of locking posts 416 extending outwardly from the

1 bottom surface 406. The locking posts 416 are constructed
2 and arranged to cooperate with sockets 210 located at the
3 second longitudinal end of the structural wall panels 202,
4 203 and 302. The fixed roof panel 402 is placed over the
5 assembled left, right, and rear walls and lowered into place.
6 The locking posts 416 are lined up with the corresponding
7 sockets 210 in the wall panels 202, 203, and 302. The fixed
8 roof panel 402 is secured in place by pulling downward on the
9 panel until the spring tabs 446 integrally formed into the
10 locking posts 416 engage corresponding apertures 234 formed
11 in the sockets 210. The result is a positive mechanical
12 connection between the wall panels 202 and 302 and the fixed
13 roof panel 402.

14 The fixed roof panel 402 includes an upper track groove
15 418 adjacent to each of the two side closed edges 410, 414
16 and extending along the top surface 404. The upper track
17 groove 418 extends inwardly into the fixed roof panel and is
18 constructed generally having a V-shaped cross section, and is
19 arranged to cooperate with the tracks 430 which extend
20 outwardly from the bottom surface 422 of the telescoping roof
21 panel 403. The fixed roof panel also includes a outer track
22 groove 488 adjacent to each of the two side closed edges 410,
23 414 extending along the bottom surface 406. The outer track

1 groove 488 extends inwardly into the fixed roof panel 402 and
2 is constructed having a generally U-shaped cross section.

3 Continuing with regard to FIGS. 13-15, the roof assembly
4 400 also includes a right wall cap 450 and a left wall cap
5 470. The right wall cap includes a top surface 452, a bottom
6 surface 454, an inner closed edge 456, and an outer closed
7 edge 458. The lower surface 454 is constructed with a
8 plurality of outwardly extending locking posts 416 which are
9 arranged to cooperate with sockets 210 located at each
10 longitudinal end of the structural wall panels 202, 302, and
11 203. Along the lower surface 454 and adjacent to the inner
12 closed edge 456 is an inner track groove 482 having a
13 generally U-shaped cross section. The top surface 452 is
14 constructed generally smooth having an upper track groove 460
15 with a generally V-shaped cross section extending along a
16 longitudinal centerline.

17 The right wall cap 450 is placed over the assembled right
18 wall and lowered into place. The locking posts 416 are lined
19 up with the corresponding sockets 210 in the wall panels 202,
20 203, and 302. The right wall cap 450 is secured in place by
21 pulling downward on the cap until the spring tabs 446
22 integrally formed into the locking posts 416 engage
23 corresponding apertures 234 formed in the sockets 210. The

1 result is a positive mechanical connection between the wall
2 panels 202, 203 and 302 and the wall cap 450.

3 The left wall cap 470 includes a top surface 472, a
4 bottom surface 474, an inner closed edge 476, and an outer
5 closed edge 478. The bottom surface 474 is constructed and
6 arranged with a plurality of outwardly extending locking
7 posts 416 which cooperate with sockets 210 located at the
8 second longitudinal end of the structural wall panels 202,
9 203 and 302. Along the bottom surface 474 and adjacent to
10 the inner closed edge 476 is a generally U-shaped inner track
11 groove 482. The top surface 472 is constructed generally
12 smooth having an upper track groove 460 with a generally V-
13 shaped cross section extending along a longitudinal
14 centerline.

15 The left wall cap 470 is placed over the assembled left
16 wall and lowered into place. The locking posts 416 are lined
17 up with the corresponding sockets 210 in the wall panels 202
18 and 302. The left wall cap 470 is secured in place by
19 pulling downward on the cap until the spring tabs 446
20 integrally formed into the locking posts 416 engage
21 corresponding apertures 234 formed in the sockets 210. The
22 result is a positive mechanical connection between the wall
23 panels 202 and 302 and the left wall cap 470.

1 Continuing with regard to FIGS. 13-15, the telescoping
2 roof panel 403 includes a top surface 420, bottom surface
3 422, and four closed edges 424, 426, 428 and 430. The top
4 surface is constructed generally smooth and includes a pair
5 of integrally formed sockets 484 which are constructed and
6 arranged to slidably cooperate with outer track guides 490.
7 The outer track guides 490 are generally C-shaped and
8 constructed and arranged to be secured to the telescoping
9 roof panel 403 and to slidably cooperate with the outer
10 track groove 488 in the fixed roof panel 402. The upper
11 surface also includes an integrally formed handle 492. The
12 bottom surface includes a plurality of strengthening ribs
13 482. The strengthening ribs add structural rigidity and load
14 capacity to the roof assembly 400. The bottom surface 422
15 also includes a pair of integrally formed sockets 484 which
16 are constructed and arranged to cooperate with inner track
17 guides 486. The inner track guides 486 are constructed and
18 arranged to slidably cooperate with their respective inner
19 track grooves 482 in wall caps 450, 470. Adjacent to each of
20 the two side closed edges 424, 428 and depending downwardly
21 from the bottom surface 422 are tracks 430. The tracks 430
22 have a generally V-shaped cross section to cooperate with the
23 upper track grooves 418 of the fixed roof panel 402 and the
24 wall caps 450 and 470.

1 The telescoping roof panel 403 is placed over the
2 assembled fixed roof panel 402, and the assembled first and
3 second wall caps 450, 470 and lowered into place aligning the
4 tracks 430 with their respective upper track grooves 418.
5 The inner track guides 486 are secured in place by pushing
6 upward on each of the inner track guides until the spring
7 tabs 446 integrally formed into the inner track guides 486
8 engage corresponding apertures 234 formed in the sockets 484.
9 The result is a positive mechanical connection between the
10 inner track guides 486 and the telescoping roof panel 403.
11 The outer track guides are secured in place by pushing
12 downward on the outer track guide until the spring tabs 446
13 engage corresponding apertures 234 formed in the sockets 484.
14 The result is a positive mechanical connection between the
15 inner track guides 486 and the telescoping roof panel 403.
16 The cooperative sliding engagement between the upper, inner,
17 and outer track guides allow the telescoping roof panel to be
18 easily and reliably retracted and extended to allow easy
19 access to the enclosure contents. The construction of the
20 inner and outer track guides provide anti-lift protection and
21 security to the contents of the enclosure.

22 Referring to FIGS. 16-19, the enclosure includes a door
23 assembly including a left and a right door panel, a hinge
24 means, a left and a right door header, and a latch assembly.

1 The left door panel 502 and right door panel 503 constitute
2 the panels in the system used to construct the door assembly.
3 The left door panel 502 is configured having a first
4 longitudinal end 508 including at least one integrally formed
5 socket 210. The socket 210 is generally constructed and
6 arranged to cooperate with a hinge cap 336 having a C-shaped
7 annular portion. The second longitudinal end 512 includes a
8 plurality of integrally formed sockets 510. The sockets are
9 generally constructed and arranged to cooperate with the left
10 header 550. The left header 550 is constructed with a
11 plurality of outwardly extending locking posts 416 which are
12 constructed and arranged to cooperate with sockets 210
13 located at the second longitudinal end 512 of the left door
14 panel 502. To facilitate mechanical connection with other
15 side wall panel members 202 in a pivoting relationship the
16 left side panel is provided with a first horizontal edge 514
17 constructed with a semi-circular conduit 516 extending from
18 about the first longitudinal end 508 past the middle portion
19 of the edge. The hinge cap 336, and the semi-circular
20 conduit 516 each containing at least one hinge means
21 illustrated as a C-shaped annular portion 518 having an open
22 side 520 constructed and arranged to accept a hinge pin 128,
23 or a dowel pin 220 and to cooperate with a hinge clip 540 to
24 close the annular cavity 518 and allow pivoting movement of

1 the left door panel 502. The second horizontal edge 522 is
2 constructed generally flat.

3 The right door panel 503 is configured having a first
4 longitudinal end 509 which includes an integrally formed C-
5 shaped annular hinge portion 524. The second longitudinal
6 end 513 includes a plurality of integrally formed sockets
7 510. The sockets are generally constructed and arranged to
8 cooperate with the right header 552. The right header 552
9 is constructed with a plurality of outwardly extending
10 locking posts 416 which are constructed and arranged to
11 cooperate with sockets 210 located at the second longitudinal
12 end 513 of the left door panel 503. To facilitate mechanical
13 connection with other side wall panel members 202 in a
14 pivoting relationship the right door panel is provided with a
15 first horizontal edge 515 constructed with a semi-circular
16 conduit 517 extending from about the second longitudinal end
17 513 toward the middle portion of the edge. The integrally
18 formed hinge portion 524, and the semi-circular conduit 517
19 each containing at least one hinge means illustrated as a C-
20 shaped annular portion 518 having an open side 520
21 constructed and arranged to accept a hinge pin 128, or a
22 dowel pin 220 and to cooperate with a hinge clip 540 to close
23 the annular cavity 518 and allow pivoting movement of the
24 right door panel 503. The second horizontal edge 523 is

1 constructed generally flat with the exception of a optional
2 ledge 532 extending the full length of the panel. The
3 optional ledge 532 may be attached by any suitable fastening
4 means well known in the art or may be integrally formed with
5 the panel. The right door panel 503 is also provided with a
6 lower sliding latch mechanism 534.

7 Continuing with regard to FIGS. 16-19, the outer surface
8 528 of the panels 502, 503 are constructed generally smooth
9 having a plurality of inwardly bowed surfaces 530 for added
10 strength and aesthetic appearance. The inside surface of the
11 left and right door panels 502 and 503 are constructed with a
12 plurality of ribs 504 extending from the first edge 514
13 across the panel 502 to the second edge 522. Each of the
14 ribs 504 may be provided with a plurality of gussets (not
15 shown) to further strengthen the panel 502. The ribs 504
16 increase the structural integrity of the enclosure 10 by
17 preventing the panels 502 from bowing or bending, inwardly or
18 outwardly and thus, adversely affecting the appearance or
19 operation of the enclosure 10.

20 Referring to FIG. 17-19, the door panels 502, 503 are
21 attached to the interconnected floor panels 100, and the left
22 and right side wall assemblies 200 by aligning the hinge pins
23 and sliding the panel horizontally into place over the
24 respective pins and engaging the hinge clips 540. The body

1 of the hinge clip 540 is generally concave and rectangular
2 and includes spring tabs 542 located at each end adapted to
3 fit within the respective hinge caps to secure the door
4 panels to the hinge pins and facilitate independent
5 rotational movement of each door. It should be appreciated
6 that this construction allows the doors to be installed or
7 removed without disassembling or partially disassembling
8 other components from the enclosure 10. The construction
9 also provides economic advantage allowing inexpensive hinge
10 components to be easily removed and replaced in the event
11 they become damaged. The right door panel is also provided
12 with removable and replaceable door latching mechanism 534

13 Referring to FIGS. 20-21, installation of the lower door
14 latch is illustrated. The door latch is constructed and
15 arranged to allow simple push-in installation. The latch
16 housings 552 are merely pushed into apertures 546 located
17 adjacent to edge 523 in the door panel 503 until the spring
18 clips 548 engage the panel 503. Thereafter the one end of
19 the door latch pin 554 is inserted through the housing 552
20 and downwardly until spring clip 550 is snapped into place.
21 In this manner the door latches can be installed and removed
22 as need without the need for tools or screw type fasteners.
23 By sliding the latch pin 554 to extend it outwardly to engage

1 the floor assembly 100 the contents contained within the
2 enclosure 10 are secured.

3 All patents and publications mentioned in this
4 specification are indicative of the levels of those skilled
5 in the art to which the invention pertains. All patents and
6 publications are herein incorporated by reference to the same
7 extent as if each individual publication was specifically and
8 individually indicated to be incorporated by reference.

9 It is to be understood that while a certain form of the
10 invention is illustrated, it is not to be limited to the
11 specific form or arrangement herein described and shown. It
12 will be apparent to those skilled in the art that various
13 changes may be made without departing from the scope of the
14 invention and the invention is not to be considered limited
15 to what is shown and described in the specification.

16 One skilled in the art will readily appreciate that the
17 present invention is well adapted to carry out the objectives
18 and obtain the ends and advantages mentioned, as well as
19 those inherent therein. The embodiments, methods, procedures
20 and techniques described herein are presently representative
21 of the preferred embodiments, are intended to be exemplary
22 and are not intended as limitations on the scope. Changes
23 therein and other uses will occur to those skilled in the art
24 which are encompassed within the spirit of the invention and

1 are defined by the scope of the appended claims. Although
2 the invention has been described in connection with specific
3 preferred embodiments, it should be understood that the
4 invention as claimed should not be unduly limited to such
5 specific embodiments. Indeed, various modifications of the
6 described modes for carrying out the invention which are
7 obvious to those skilled in the art are intended to be within
8 the scope of the following claims.

9